GLOBAL ONLINE ACADEMY

BLDS Design Brief

Your Name: Elena Cortés
Selected Design Challenge: Supporting Inquiry: The Quadratic Formula.

The Design Brief documents your process in tackling a BLDS design challenge. It is a synthesis of backward design and GOA's blended learning strategies. If you're not familiar with the book *Understanding by Design* by Jay McTighe and Grant Wiggins or their UbD framework, it is a very useful read for educators.

Design Briefs are composed of three phases: **Vision**, **Action**, and **Reflection**. At each phase, you have the option to submit your brief for feedback from your coach and BLDS colleagues. When you complete the brief, you are eligible to receive a badge for completing a BLDS challenge and a place in our BLDS Gallery. Completed briefs should be submitted for badges in our Catalyst Badge Headquarters in Canvas. We use Google Docs for briefs because we want them to be *dynamic* and *interactive* and *shareable*: we want it to be a canvas on which you work through ideas, just like someone working in an art studio. You'll submit evidence in various formats here, your coach and colleagues will leave comments, and you'll make edits as you go.

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Vision: Make a Plan

The first step in blended learning design is to clearly articulate your objectives and the strategies you'll use to achieve them.

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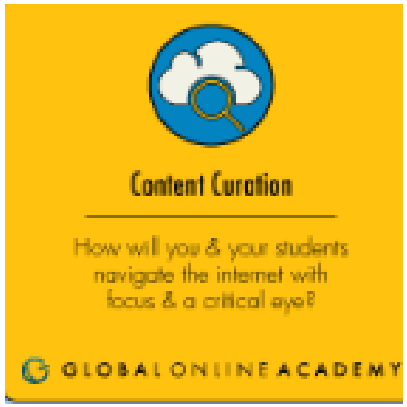
Vision Step 1: Articulate your Objectives

What are your desired results?	What is acceptable evidence?	What is the key context?
These can be GOA core competencies or competencies/standards you bring to BLDS. Be clear about what your students *will be able to do* once this experience is over. (Helpful tool for drafting your own results: the Bloom's Bank on p. 6-7 in your Catalyst Journal.)	In this space, describe the observable and measurable outcomes that will show you've achieved your results. What will your students produce that indicates progress towards goals?	Articulate the parameters of your design. What age are your students? What learning experiences are they coming from? Heading towards? What are key constraints (time, space, resources, etc) that you face?
Students should be able to: • Understand the vocabulary related to the quadratic formula (coefficient, discriminant, real solution, imaginary solution, irrational solution) • Name real life situations described by quadratic functions for which the quadratic formula might help us answer a question. • Use the quadratic formula for solving a quadratic equation. • Relate the quadratic formula to other Math concepts/applications that they have learned already or will learn in future Math courses during High School. • Leverage their curiosity to curate and create content that is relevant to real-world issues. • Reflect on and take responsibility for their learning and that of others in an open forum.	• Draft document containing evidence of their research (teamwork) • Electronic Instructional resource (brochure, video, slide presentation…) to teach each other about the quadratic formula using text, images and any other method they can think of (teamwork) • Self-reflection on their progress through the material and on the value of learning this concept for their growth as mathematicians (individual) • Asynchronized interaction with peers to help them solve questions / generate strategies on how to use this content. • Individual Assessment on the use of the quadratic formula (paper and pencil)	• Grade 10 students in the regular class (15 going into 16). • They have been exposed to this concept before, in G8. • If they continue in the regular Math strand, they will need this concept again for G11 and G12 Math. • This concept is part of a unit on quadratic equations that we have already started. The unit addresses strategies for solving quadratic equations.First half of unit is factoring, second half is quadratic formula. • The unit test is scheduled for October 27th and cannot be delayed further than that. • Check with our school librarian or the Instructional Coaches if he would be available during the week of October 10 to do a brief chat on how to select reliable web resources and improve searches. • Look for an external audience: G9?

This is a reproduction of a document. To protect student privacy, some links have been removed.

Vision Step 2: Select your Strategies

Build a Personal Strategy Bank	Making a Meaningful, Relevant Experience	The Role of Technology
In this space, copy and paste the strategies you'll apply from GOA's Strategy Bank. Try to limit yourself to the two to four that matter most to this experience.	Describe the activities that will make up this experience and the order in which those activities might take place. Feel free to sketch, to outline, to bullet point.	Be specific about the tools you and students will use. Include tools you know and are available to you and, if you like, describe tools you might want to learn to make the experience richer. Leave brief thoughts on why these tools and specific features you want to leverage.
 	**Week 1 (Oct 17 to Oct 21)** 1. G-Doc draft with 3 best online resources on the quadratic formula and why they think so. Document must include all web images they intend to use properly credited. Document must justify reliability of the sources chosen and give credit to the sources. Due Oct 18 2. Use "Breaking News" to make connections between the quadratic formula and real life situations where it could be useful and to help them connect their learning about this in G10 with future learning in G11 or G12 (interview teachers/peers in those grades) Due Oct 21, linked on their draft. **Week 2 (Oct 24 to Oct 28)** 3. Electronic instructional resource of their choice (brochure, video, slide presentation….) draft due Oct 24. Share with two teams, get feedback (using feedback prompts.) and make modifications. 4. Use "Freeze!" and have students	• G-Docs.. Fosters virtual collaboration among team members. • Haiku LMS. Organizes content, allows video/audio/text responses to quizzes and feedback opportunities through discussion forums., Helps to conduct activities analysis.

	upload a photo/video/text describing their progress. Individual, due Oct 24 in the "Freeze!" Haiku Discussion. 5. Final draft of Instructional resource due Oct 25, upload to discussion forum. 6. Use "How did we do" in an individual self reflection quiz. Due Oct 31 Link to The Quadratic Formula Gantt Chart	

When you've finished your Vision, you may move on to the next step or use the BLDS Slack Community to submit your brief to your coach and colleagues for feedback. You've completed the first step towards earning BLDS badges!

Action: Test Your Design With Your Students

Competency-based learning is built on the foundation that students demonstrate learning by submitting evidence of their work. Here, we're asking you to do the same: show us your design in action!

Evidence should include

- Documentation of the learning process
- Example(s) of student work
- Feedback from students about the experience

There are many ways to share this work: record a video and share a link; take photos of students at work and the work they produce; take screenshots of students utilizing digital tools to create content; record post-experience interviews with students; have students complete a survey and share the results; write a narrative where you include links to relevant examples. Use the space below to share this work (don't worry if you end up using more space than what's here!).

- Session on research skills: how to assess source quality, how to cite sources and give credit to images.
  Our librarian conducted a mini-Lesson on research and citation using the resources that we have available at our school. Students were able to ask questions then:

  research_draft_Sofia

- "Breaking News": Students were requested to produce videos interviewing an expert (Math/Science teacher, G11 or G12 peer, Engineers, Economists....) to learn about the use of the quadratic formula in real life and how it connects to their future Math learning..

  JuanPablo_H interviews Ms. Steele (G10 G11 Math)

- The final Product for this experience was an electronic resource to help them teach each other the quadratic formula before the unit exam. Students were able to use the format of their choice for this final product.

  Belinda-Slides Presentation

Personal reflection describing learning progress during the experience, done through the discussion feature of our LMS. Students were instructed to post videos, pictures, audios or written posts.

Samples from the Freeze discussion posts in Haiku. 26/42 students answered

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$\frac{-b}{2a}$ is the *axis of symmetry*

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Observation:
Components of the quadratic formula reveal characteristics of a parabola (quadratic).

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$b^2 - 4ac$ is the *discriminant*

This summarises my learning because this was the topic I researched form my project. The topic was parts of the formula and this picture is it. The coefficients are part of them and most important the discriminant. With the discriminant you get to know the number of solutions the formula is going to have.

Posted on: Oct 25, 2016, 11:06 am

At first the quadratic formula for me seemed impossible by seeing it I couldn't figure out what to do with it because of the coefficients after learning how to use it in real life applications, getting feedback and their knowledge from more experiences teachers/experts and practicing it by my own with Ms Cortes it has really helped me understand how to use it. At this moment I am capable of finding the numbers in this case what a means b and c then plugging it in to the formula and solving. I am proud of my achievements and my learnings because I at first thought it would be really hard and after time I am capable of completing this challenge. This was a very good learning experience because not only was I learning the process of the formula but I was learning its creation and other people opinions about this formula. I look forward to continue learning about this and to continue using this method in my daily life.

Posted on: Oct 24, 2016, 10:39 pm

YES

http://publicdomainarchive.com/wp-content/uploads/2015/03/public-domain-images-free-stock-photos-autumn.jpg

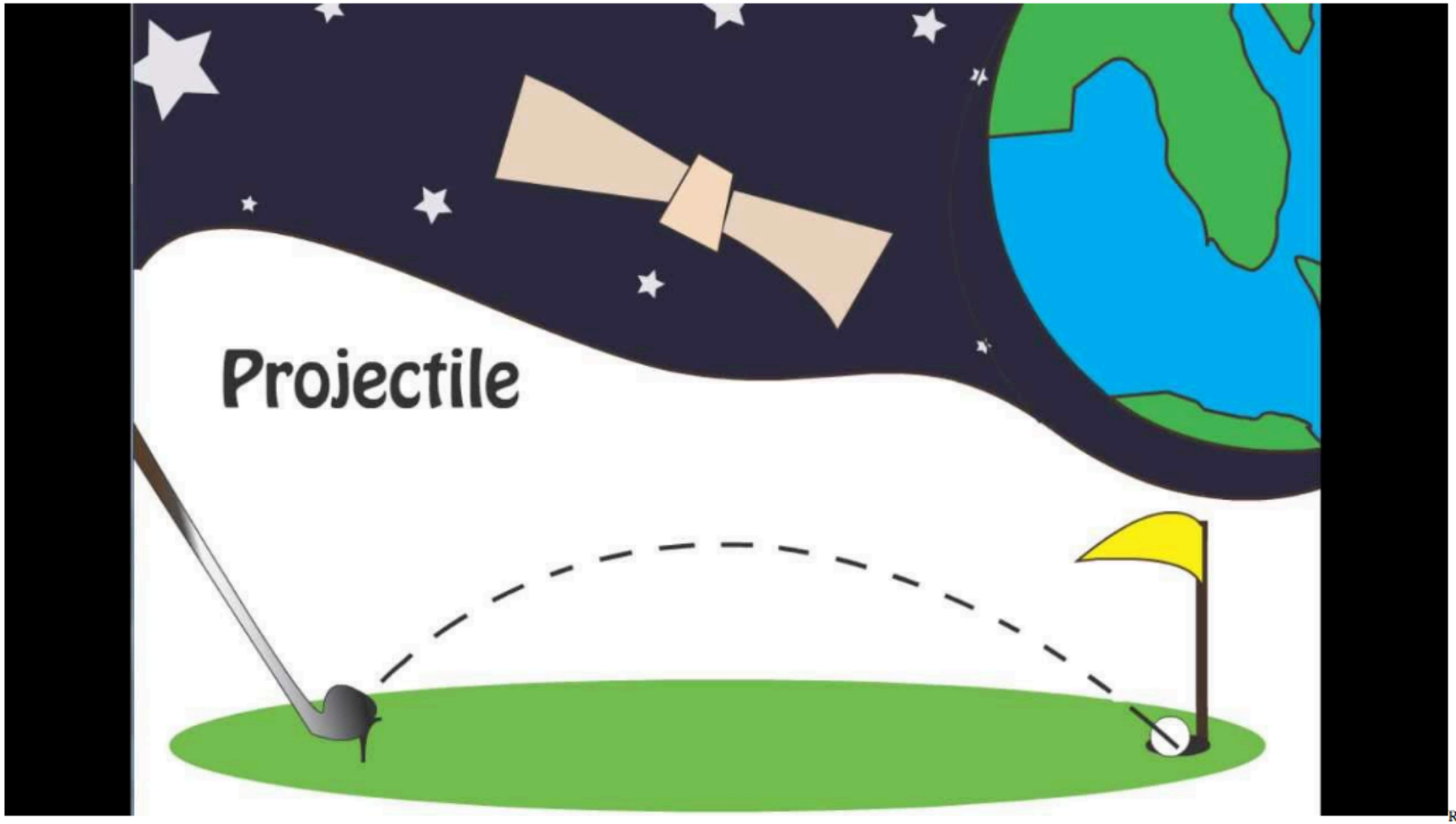
Posted on: Oct 23, 2016, 07:15 pm

.LEZ

So far we are done with our information but we still need to do the video and the final piece of the project.

Posted on: Oct 24, 2016, 10:01 am

At first, I thought that the quadratic formula was just a random formula that had no background to it and that it was only used to solve problems in math class and there was no reason to deeply learn about it. I thought that the quadratic formula was only going to be used in math class and we wouldn't use it on a daily basis, but we do, I learned that the quadratic formula takes a huge amount of part in our lives since lots of things we do like throwing a ball, riding a bike, or even in satellite dishes we use quadratic formulas. Also, I learned about its history and that it's said that the Babylonians were the first to solve quadratic equations around 400 BC, which makes us realize that the equations that we use have a purpose and a history.



Real Life

This is my audio.

Attachments:

Download New Recording 59.m4a

Posted on: Oct 24, 2016, 11:01 pm

LAMAR

I have really liked this learning experience of the quadratic formula. It took me a while to get the hang of it, but eventually I got to understand it pretty well. I have learned a lot about the quadratic formula through this project and I have dominated the mathematical aspect of it. I fully understand all the values and mathematical terms regarding this formula. I have also understood how important this formula is in life because it is used in various subjects such as physics, engineering and calculus. What I am having difficulties in is in the history of the quadratic formula since I don't understand it very well and all of the electronic pages are very long and detailed articles. Other than that, the learning experience has been great and I have learned a lot about this subject through the various activities in this project.

Posted on: Oct 24, 2016, 08:45 pm

IALES

At the beginning of the unit when we started doing the quadratic formula I struggled since I didn't knew how to do it. After I did a small amount of research I found out that we had already studied this back in 8th grade. I didn't remember 100 percent but I did rememberer some stuff of how to solve for it. Right now I clearly understand the method and the way we use it since I did research and also since I have had a quiz and I studied a lot for it.

Posted on: Oct 24, 2016, 09:12 pm

IRA

I think that I know about the quadratic formula and I know how to use it when I need to in my Advanced Algebra class. However, I am still unsure of when I will use it in real life and in a real situation.

Posted on: Oct 25, 2016, 10:33 am

Reflection: Consider Your Design's Impact

Complete your design brief by responding to the below questions. If you prefer a different format, make a video or audio recording, upload it to a sharing website like YouTube or Soundcloud, and paste the link below.

Of the results you articulated in your Vision, which did you feel students made the most progress in developing? How do you know?	Out of all my expected results I believe students made the most progress in the following three: • Understand the vocabulary related to the quadratic formula (coefficient, discriminant, real solution, imaginary solution, irrational solution) • Name real life situations described by quadratic functions for which the quadratic formula might help us answer a question. • Use the quadratic formula for solving a quadratic equation. The first and last results were assessed through the electronic final product that students produced to teach each other, during our class conversations and at the unit test, The majority of students can now use the correct terminology for the different parts of the formula, can calculate the discriminant and make predictions about the number and the type of solutions a quadratic equation has. as well as how to solve it with the aid of the quadratic formula, Thanks to the interviews that they conducted with experts and the research that was done online, the majority of students can name a real life application of the quadratic formula. They also state this in the final survey (How did we do?). However, they do not feel confident about actually explaining the application to a peer (refer to the survey again) , but that was not really an expected outcome for this activity.
Of the strategies you selected, which was the most successful in your design? How do you know?	The review and reflection of their own learning strategy was confusing. Although students did post a self-reflection on our Haiku page half way through the experience, a big part of it was more a summary of their current progress in the project than a personal evaluation of their level of understanding. A specific question on the final survey also addressed the self reflection part (How did this activity help you to reflect about your learning?) and I can tell by their answers that the intention of the question was unclear.

What was notable about students' interaction with your design? What was the most useful feedback you received from students?	A recurrent theme in the survey feedback is the need of clear instructions at the beginning of the experience. I believe it was hard for them to understand that they were working at two levels: team effort to acquire knowledge and develop skills to use the quadratic formula on one side and individual level to reflect on their learning on the other. Students also felt pressed with time at some points, and the deadlines were moved forward. Although we did have some chunks of time to work on the project during class it was not enough and they needed to cooperate outside the classroom. This expectation needs to be clarified since the beginning.
What's next for this design? What elements will you use again? What changes do you feel you need to make?	The research part worked well and the fact that the project was done in teams. Giving choice for the final product format was a way to remove stress from those who are less versed in technology. Kids also enjoyed the interview with the experts. For next time I believe students will make the most of them if they are trained in advance and can see a couple of examples. A recurrent feedback on the survey was to dedicate more time to give instructions at the beginning of the experience. I believe substituting the oral explanations for videos they can access as needed could help. Students also need more clarification on the self-reflection piece and I would like to encourage them to be more innovative in the use of visual/audio resources for given their responses instead of just writing them down, although our LMS is not that flexible and that might be the reason they they have chosen the easy way.

Finished?

Submit your completed design brief to earn BLDS Badges for the strategies you used in your design!